

1 Docket No. VRO-004.01

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3 ATHERMAL ANNEALING WITH RAPID THERMAL ANNEALING SYSTEM AND METHOD

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5 ABSTRACT

6 A method and system to achieve shallow junctions using  
7 Electromagnetic Induction Heating (EMIH) that can be preceded or  
8 followed by a low-temperature Rapid Thermal Annealing (RTA)  
9 process. The methods and systems can use, for example, RF or  
10 microwave frequencies to induce electromagnetic fields that can  
11 induce currents to flow within the silicon wafer, thus causing  
12 ohmic collisions between electrons and the lattice structure that  
13 heat the wafer volumetrically rather than through the surface.  
14 Such EMIH heating can activate the dopant material. Defects in  
15 the silicon structure can be repaired by combining the EMIH  
16 annealing with a low-temperature (approximately 500 - 800 degrees  
17 Celsius) RTA that causes minimal diffusion, thus minimizing the  
18 difference between the as-implanted junction depth and the post-  
19 annealing junction depth when compared to annealing methods that  
20 only use traditional RTA.